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ABSTRACT

Two aspects of allocation of study time were examined among 48 third- and 48 fifth-grade children. Aspects examined were: (1) allocation of more time to more difficult material; and (2) allocation of sufficient time to meet a recall goal. Under a self-terminated procedure, children studied two booklets, one of which consisted of easy or highly related paired-associate items, such as dog-cat, and one of which consisted of hard or unrelated items, such as book-frog. Findings indicated that with some practice, children in both grades would spend more time on hard pairs than on easy pairs. Children had difficulty in spontaneously monitoring the progress of learning and allocating sufficient time to hard pairs. Brief instructions on how to use self-testing strategies greatly improved many children's assessment of recall readiness. (RH)

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Allocating Study Time Appropriately: Spontaneous and Instructed Performance

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Allocating Study Time Appropriately:
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Abstract

Two aspects of allocation of study time were examined in grades 3 and 5 children: allocating more time to more difficult material and allocating sufficient time to meet the recall goal. Children studied two booklets (one "easy" or highly related, and one "hard" or unrelated) of paired-associate items under a self-terminated procedure. Both grades 3 and 5 children, with some practice, spent more time on hard pairs than on easy pairs, but had difficulty in spontaneously monitoring the progress of learning and allocating sufficient time on hard pairs. Brief instructions on how to use self-testing strategies greatly improved many children's assessment of recall readiness.

Allocating Study Time Appropriately: Spontaneous and Instructed Performance

The present study examined children's spontaneous tendency, as well as their ability, to monitor the difficulty of the materials and the progress of learning for determining how long to study paired-associate items. By monitoring the difficulty of materials, students can use study time effectively by spending more time for studying material that is harder to learn (differential allocation of time). Differential allocation of study time, however, does not always lead to a successful test performance. To do well on the test, children must also assess, by some form of self-testing, whether they have studied the material sufficiently to meet the study goal (sufficient allocation of time). Although we have some information concerning developmental differences in children's use of study time (e.g., Masur et al., 1975; Leal et al., 1985), these two aspects of allocation of study time have not been examined in a single study situation. Furthermore, children's skills to use self-testing strategies for a paired-associate task have not been reported previously. The following questions, then, provided the focus of the present study: (1) Do children spontaneously (a) allocate more time to more difficult units of material, and (b) use self-testing strategies as a means for determining whether they have mastered the material sufficiently? (2) Can children be induced to use study time in the manner described above (i.e., a and b) through brief instructions, even though they may not do so on a spontaneous basis?

Method. The materials consisted of two types of booklets of paired-associate line drawings: "easy" booklets, made up of highly related items (e.g., dog-cat); and "hard" booklets, made up of unrelated items (e.g., book-frog). To minimize differences in task difficulty across grade levels, the list length was varied. Forty-eight children at each of grades 3 and 5 were randomly assigned to a spontaneous group or an instructed group. Children in both groups received the same instructions on trial 1. They were asked to study two booklets (one easy and one hard) until they were sure they could

remember all the pairs perfectly; and a recall test followed. On trials 2 and 3, children in the spontaneous group received the same self-terminated study procedure, using two new booklets (one easy and one hard) on each trial. Children in the instructed group additionally received brief instructions on how to allocate study time differentially (study easy booklet once, but study the hard booklet at least twice), and on how to use a self-testing strategy (e.g., cover each of the response items with your hand before you see it, try to guess what the covered item is, and then study again if you miss some of the items). The entire session was videotaped in order to measure children's study times and to identify their self-testing behaviors.

Results and Conclusions. Although students did not allocate study time differentially on the first trial, by the third trial, both grades 3 and 5 children in the spontaneous group spent significantly more time per pair for hard items (grade 3 $\underline{M}$ = 6.12 s, grade 5 $\underline{M}$ = 10.02 s) than for easy items (grade 3 $\underline{M}$ = 4.33 s, grade 5 $\underline{M}$ = 5.95 s). Over trials, grade 5 children increased the time they spent studying the hard booklet and decreased the time they spent on the easy booklet. Grade 3 children, on the other hand, only decreased the time they spent studying the easy booklet over trials. As expected, a more distinctive pattern of differential allocation of time was observed in the instructed group; regardless of grade, students in the instructed group spent significantly more time on the hard booklet on trials 2 ($\underline{M}$ = 15.92 s) and 3 ($\underline{M}$ = 14.42 s) than the students in the spontaneous group (trial 2 $\underline{M}$ = 7.98 s, trial 3 $\underline{M}$ = 8.07 s), although students in both groups studied the easy booklet equally briefly on all trials.

Children in both grades had greater difficulty spontaneously monitoring the current state of learning to allocate sufficient study time to meet the recall goal. As shown in Table 1, recall scores for the hard items for the spontaneous group were far from perfect at both grade levels, and showed a slight but nonsignificant improvement over trials. Nearly all grade 3 children (96%) and a large majority of grade 5 children (83%) did not spontaneously use any type of self-testing strategy. Giving children brief

instructions to use a self-testing strategy resulted in a significant improvement in recall scores for the instructed group as compared to the spontaneous group (see Table 1). An examination of the study behaviors of the instructed group revealed the following: (a) Although many children experienced difficulty in consistently remembering to cover the response picture prior to looking at it, all children (with the exception of one grade 3 child) applied the self-testing strategy correctly at least for some of the pairs; and (b) about one half of the children failed to study further or use self-testing again even though they did not recall all the items during self-testing, while the remaining half repeated the use of self-testing until they recalled all the pairs.

The present data suggest that both grades 3 and 5 children spontaneously show differential allocation of study time after some practice. As we described, however, grades 3 and 5 children differed in how they altered their study times over trials to achieve differential allocation. In contrast to their performance allocating time differentially, the recall scores indicate that both grades 3 and 5 children have greater difficulty in spontaneously allocating sufficient study time to meet the study goal. One factor accounting in part for children's inaccurate assessment of recall readiness is their failure to spontaneously use self-testing strategies. When instructed to use a self-testing strategy, children's recall scores became much closer to the study goal. Our observational data suggest that, although most grades 3 and 5 children are able to correctly apply a self-testing strategy for paired-associate items, nearly one half of children at these two grade levels may not use the results of self-testing for conducting further study that is needed. As a result, not all children will show complete mastery of the material even when they use self-testing.

Table 1

Mean Recall Percentages of Hard Items Across Trials For Grades 3 and 5 Under Spontaneous and Instructed Conditions

	Trial 1	Trial 2	Trial 3
Spontaneous			
Grade 3	42% (2)*	56% (3)	51% (1)
Grade 5	46% (0)	58% (3)	58% (1)
Instructed			
Grade 3	50% (0)	78% (7)	72% (6)
Grade 5	49% (1)	77% (8)	75% (7)

*Note: Figures in parentheses indicate the number of children who achieved perfect recall.